

CLAIMS

- 1 A syringe comprising:
- 5 (a) a barrel having a cylindrical interior surface substantially free of discontinuities over its usable extent;
- 10 (b) a plunger including a plunger head and a shaft;
- 15 (c) a restrictor bobbin movable with respect both to the barrel and the shaft to permit the drawing up and delivery of a fluid over the usable extent of the barrel, whilst limiting further use of the syringe;
- 20 (d) the restrictor bobbin and/or shaft together comprising one or more members which are freely movable with respect to each other over a limited distance which is smaller than the usable extent of the barrel so as to permit repeated distal and proximal cycles of movement of the plunger head over the said limited distance.
- 2 A syringe as claimed in claim 1 wherein the said members which are freely relatively movable to permit repeated movement of the plunger head comprise the complete restrictor bobbin, the complete plunger shaft, or a part or parts of either or any combination thereof.
- 25 3 A syringe as claimed in claim 1 or claim 2 wherein the said movable member(s) comprise or may be provided by deformable portions of the bobbin or shaft, which are preferably resiliently deformable.
- 4 25 4 A syringe as claimed in any preceding claim wherein the said repeated movement of the plunger head is permitted at least when the plunger head is at or adjacent a proximal end of the said usable extent of the barrel.
- 30 30 5 A syringe as claimed in any preceding claim, wherein the said repeated movement of the plunger head is permitted at substantially every relative position of the plunger and barrel over the said usable extent of the barrel.

- 6 A syringe as claimed in any of claims 1 to 4 wherein the said free movement of the bobbin and shaft with respect to each other is permitted in a first region of the shaft and resisted in a second region of the shaft.
- 5 7 A syringe as claimed in any preceding claim, wherein the distance over which the said repeated movement of the plunger head is possible is between 0.1 and 50% of the said barrel usable extent, preferably between 1 and 20%.
- 10 8. A syringe as claimed in any preceding claim, wherein the said distance over which repeated movement of the plunger head is possible corresponds to a swept volume which is between 10 and 2,000 microlitres, preferably between 50 and 1,000 microlitres, more preferably between 100 and 500 microlitres.
- 15 9 A syringe as claimed in any preceding claim, wherein the said distance over which repeated movement of the plunger head is possible is 0.5mm to 20mm, preferably 1mm to 15mm, more preferably 1.5mm to 10mm, still more preferably 2mm to 7mm or about 3mm or 4mm.
- 20 10 A syringe as claimed in any preceding claim wherein the restrictor bobbin incorporates a projection, tine, tang, barb, serration or other like formation or member in engagement with the barrel interior wall to resist motion in one direction and permit motion in the opposite direction.
- 25 11. A syringe as claimed in any preceding claim wherein the plunger is provided with formations for restricting the movement of the restrictor bobbin with respect to the plunger shaft.
- 30 12 A syringe as claimed in claim 1 or any of claims 3 to 11 wherein the plunger shaft is formed with a first region over which unrestricted movement of the shaft with respect to the restrictor bobbin is possible and a second region over which movement of the shaft with respect to the restrictor bobbin is substantially restricted to unidirectional movement.

- 13 A syringe as claimed in any preceding claim wherein the restrictor bobbin comprises two or more relatively slidable or relatively deformable parts.
- 14 A syringe as claimed in any preceding claim contained in a sterile pack with its plunger substantially fully depressed.
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- 15 A syringe as claimed in any of claims 1 to 13 contained in a sterile pack with its plunger retracted, preferably to substantially its full extent
- 10 16 A syringe as claimed in claim 15 wherein the syringe contains diluent liquid.
- 17 A syringe as claimed in any of claims 14 to 16 wherein the bobbin incorporates a restrictor member for restricting movement of the plunger with respect to the bobbin or the bobbin with respect to the barrel, and wherein the direction in which such movement is restricted is reversible.
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